

Homework #1 - To be handed in no later than 2:41 p.m., Friday, May 19

1. Let X be the set of real numbers and let $\mathbf{T} = \{U \subseteq X : 0 \in X \setminus U\} \cup \{X\}$.

a) Show that \mathbf{T} is a topology for X .

b) Find the closure of the interval $A = (1,2)$ and of the interval $B = (-1,1)$. Explain.

2. Let X be the set of positive integers. For each $n \in X$, let $S_n = \{k \in X : k \leq n\}$.

a) Show that $\mathbf{T} = \{S_n : n \in X\} \cup \{\emptyset\}$ is a topology for X .

b) Find the closure of the set of even integers.

c) Find the closure of the singleton set $A = \{41\}$.